Listeria monocytogenes control in cold smoked salmon using natural and sodium free preservatives

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Listeria monocytogenes Control in Cold Smoked Salmon using Natural and Sodium Free Preservatives.

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Abstract:

Listeria monocytogenes is an opportunistic pathogen associated with over 1000 illnesses and high mortality rates each year in the US (ref. CDC). *L. monocytogenes* contamination and growth is a major concern for chilled cold smoked salmon (CSS). In response to WHO recommendation salt is being reduced in food products, which results in an even bigger challenge to control *L. monocytogenes* growth. This leads to an increasing demand for highly effective sodium free preservatives.

Organic acids and particularly acetic acid/acetates are well known for their inhibitive activity on *Listeria*, but consumers have negative perceptions towards synthetic-derived additives and increasingly prefer natural alternatives. Neutralized vinegar is a natural alternative for acetates and vinegar based products are developed in order to serve the modern consumer with a natural based powerful ingredient to increase the safety of low sodium CSS.

Methods:

A Danish CSS processor in collaboration with DTU Food used a combination of salting with injection brining followed by treatments on surface of filets in order to have optimal distribution of additives. Main product characteristics of CSS were 3 % water phase NaCl and pH of 6.1-6.3 (Control). Other treatments included lactate/diacetate (60% solution), 2.5%; Provian K (solid acetate/diacetate), 0.25%, 0.5% and 0.75%; Provian NDV (solid vinegar), 0.3%, 0.6%, 0.9%. For each treatment sliced products were inoculated with approximately 2 log CFU/g of a *L. monocytogenes*-cocktail. Inoculated slices were vacuum packaged and stored for 50 days at 4°C and 7°C. At each time of sampling during storage *L. monocytogenes* were enumerated in triplicate by surface plating on PALCAM agar.

Results:

Growth of *L. monocytogenes* to 7-8 log CFU/g was observed during 50 days on the CSS control treatment at both 4°C and 7°C. With an increase of 1 log CFU/g reached after one weak for this treatment. All other treatments showed reduced growth of *L. monocytogenes* and 0.75% Provian K and 0.9% Provian NDV both reduced growth to less than a 2 log CFU/g increase in concentrations during 50 days at 4°C and 7°C.

Significance:

This research demonstrated the possibility to increase safety of cold smoked salmon using preservatives that meet current food trends, like sodium reduction and natural origin.